

REMARKS

Claims 1-20 were examined. Claims 1, 14 and 19 are amended. Claims 1-20 remain in the Application.

The Patent Office rejects claims 1-4, 6-7 and 11 under 35 U.S.C. §102(b) and claims 1-20 are rejected as obvious under 35 U.S.C. §103(a). Reconsideration of the rejected claims is respectfully requested in view of the above amendments and the following remarks.

A. 35 U.S.C. §102(b): Rejection of Claims 1-2, 6-7 & 11

The Patent Office rejects claims 1-2, 6-7 and 11 under 35 U.S.C. §102(b) as anticipated by JP61-056289 of Inoi (Inoi). Inoi describes a cell with purported good accuracy and electric power efficiency by binding a mesh-type electrode for electrolysis bulged uniformly outward from the outside surface of a picture frame-shaped frame. As described in the brief "Constitution," Inoi appears to describe a cell for producing chlorine gas from caustic soda and brine. Anode and cathode bodies include passage holes 2, 3 for the anodes and cathodes and passage holes 4 for supplying dilute caustic soda and passage holes 5 for supplying brine. Communicating holes 6, 7 connect a central aperture 8 thereby constituting the ion exchange membrane method. As described "[t]he substantially entire surface of the above-mentioned electrode A of said device bulges uniformly outward from the outside surface of the frame A1 and the gasket Pm which has approximately the same shape as the shape of the frame A1 and the thickness larger than the bulging height of the electrode A1 is disposed between the electrode body and the membrane M."

Claims 1-2, 6-7 and 11 describe an apparatus including a first cell frame and a second cell frame. The second cell frame includes an in-flow port to receive an in-flow solution and an out-flow port to output a solution. Both the in-flow port and the out-flow port are placed along a perimeter of the second cell frame. Claim 11 describes an in-flow port and an out-flow port placed along a perimeter of the first cell frame.

Claims 1-2, 6-7 and 11 are not anticipated by Inoi, because Inoi does not describe a cell frame including an in-flow port and an out-flow port, both placed on a perimeter of the cell frame. At best, Inoi describes passage holes 2, 3 and 4, 5 in the body of a frame. It is not clear from the description, however, that such passage holes are in-flow and out-flow ports. Regardless, such passage holes are not along a perimeter of a frame.

Applicant respectfully requests the Patent Office withdraw the rejection to claims 1-2, 6-7 and 11 under 35 U.S.C. §102(b).

B. 35 U.S.C. §102(b): Rejection of Claims 1-4, 6-7 & 11

The Patent Office rejects claims 1-4, 6-7 and 11 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,770,035 of Faita (Faita). Faita discloses a method for the production of chlorine from aqueous solutions of hydrochloric acid in a membrane electrolysis cell. The cell comprises a cathode compartment equipped with a gas diffusion cathode fed with air or enriched air or oxygen and an anodic compartment with an anode provided with an electrocatalytic coating for chlorine evolution. Figure 1 shows an electrochemical cell of Faita. The cell comprises an ion exchange membrane 1, cathodic and anodic compartments 2 and 3, anode 4, acid feeding nozzle 5, nozzle 6, wall 7 delimiting the anode compartment, gas diffusion cathode 8, cathode supporting element 9 comprising a thick expanded metal sheet or mesh 10 and a thin expanded metal sheet or mess 11, nozzle 12, nozzle 13 and cathode compartment delimiting wall 14. The cell also includes peripheral gaskets 15 and 16, as seen in Figure 1.

Claims 1-4, 6-7 and 11 describe an apparatus including a first cell frame and a second cell frame, an anode electrode, a cathode electrode and a membrane. A screen spacer is interposed as an interface between the anode electrode and the membrane or the cathode electrode and the membrane and provide the defined distance between the membrane and electrode. Support for the spacer interposed as an interface may be found in the Application at, for example, page 14, lines 9-19.

Claims 1-4, 6-7 and 11 are not anticipated by Faita, because Faita fails to describe a screen spacer interposed as an interface between an electrode and a membrane. As noted previously, peripheral gaskets 15 and 16 of Faita appear to surround the perimeter of the cell of Faita. They are not illustrated between a membrane and an electrode or described as providing a defined distance between the membrane and the electrode.

Applicant respectfully requests that the Patent Office withdraw the rejection of claims 1-4, 6-7 and 11 under 35 U.S.C. §102(b).

C. 35 U.S.C. §103(a): Rejection of Claims 14-18

The Patent Office rejects claims 14-18 under 35 U.S.C. §103(a) as obvious over Inoi in view of the article, "Newest News About Brown's Gas" (Brown). Brown is cited for disclosing a cell frame being transparent or translucent.

Claims 14-18 describe an apparatus including a first cell frame including a first compartment containing an anode and a second cell frame including a second compartment containing a cathode. Support for a cell frame containing an anode may be found in the Application at, for example, page 8, lines 8-10. Support for a compartment containing a cathode may be found in the Application at, for example, page 9, lines 4-6.

Claims 14-18 are not obvious over the cited references, because the references do not describe a cell frame containing an anode. As noted above, Inoi teaches a cell wherein the substantially entire surface of electrode A of the device bulges uniformly outward from the outside surface of frame A1. Accordingly, frame A1 does not contain electrode A. The invention described in Inoi is directed at achieving the bulging. Thus, there is no motivation, suggestion or prediction from the cited references to contain an electrode in a compartment of a cell frame.

Applicant respectfully requests the Patent Office withdraw the rejection to claims 14-18 under 35 U.S.C. §102(b).

Appl. No. 10/645,132
Amdt Dated January 29, 2009
Reply to Office Action of 07/29/2008

D. 35 U.S.C. §103(a): Rejection of Claims 8-10 & 19-20

The Patent Office rejects claims 8-10 and 19-20 under 35 U.S.C. §103(a) as obvious over Inoi in view of U.S. Patent No. 5,783,501 of Hirai et al. (Hirai) with Brown. Hirai is cited for teaching how cell frames are joined. Brown is cited for teaching a transparent or translucent cell frame.

Claims 8-10 depend from claim 1 and therefore contain all the limitations of that claim. For at least the reason stated above with respect to claim 1 and Inoi, claims 8-10 are not obvious over the cited references. Hirai and Brown do not cure the deficiency of the citation of Inoi noted above.

Claims 19-20 describe a system including a membrane electrolysis unit comprising a first cell frame including a first compartment containing an anode electrode and a second cell frame including a second compartment containing a cathode electrode. As noted above, Inoi does not describe a cell frame including a compartment containing an anode electrode. In fact, Inoi desires its electrode A to fold outward from the outside surface of its corresponding frame A1. Hirai and Brown do not cure the deficiency of the citation of Inoi.

Applicant respectfully requests the Patent Office withdraw the rejection to claims 8-10 and 19-20 under 35 U.S.C. §103(a).

E. 35 U.S.C. §103(a): Rejection of Claims 5 & 13-18

The Patent Office rejects claims 5 and 13-18 under 35 U.S.C. §103(a) as obvious over Faita in view of Brown.

Claims 5 and 13 depend from claim 1 and therefore contain all the limitations of that claim. Accordingly, for the reasons stated above with respect to claim 1 and Faita, claims 5 and 13 are not obvious over the cited references. Brown does not cure the defect of the citation of

Appl. No. 10/645,132
Amdt Dated January 29, 2009
Reply to Office Action of 07/29/2008

Faita as it does not disclose a screen spacer interposed as an interface between an electrode and a membrane.

Claims 14-18 describe an apparatus including a first cell frame, a second cell frame, an anode, a cathode and a membrane. A spacer interposed as an interface between the cathode electrode and the first membrane to provide a defined distance between the membrane and the cathode. As noted above with respect claim 1, Faita does not describe a spacer interposed as an interface between a cathode and a membrane. Brown similarly does not disclose such a configuration.

Applicant respectfully requests that the Patent Office withdraw the rejection to claims 5 and 13-18 under 35 U.S.C. §103(a).

F. 35 U.S.C. §103(c): Rejection of Claims 8-10 & 19-20

The Patent Office rejects claims 8-10 and 19-20 under 35 U.S.C. §103(a) as obvious over Faita in view of Hirai and Brown.

Claims 8-10 depend from claim 1 and therefore contain all the limitations of that claim. For at least the reasons stated above with respect to claim 1 and Faita, claims 8-10 are not obvious over the cited references. Hirai and Brown do not cure the deficiency noted in Faita.

Claims 19-20 describe a system including a membrane electrolysis unit with a plurality of screen spacers including a first screen spacer interposed as an interface between a first cell frame and a membrane and a second screen spacer interposed as an interface between a second cell frame and a membrane. As noted above with respect to claim 1, Faita does not describe a spacer interposed as an interface between a frame and a membrane. The other references do not cure the deficiency of the citation of Faita in this regard.

Applicant respectfully requests that the Patent Office withdraw the rejection of claims 8-10 and 19-20 under 35 U.S.C. §103(a).

G. 35 U.S.C. §103(a): Rejection of Claims 1-7 & 11-18

The Patent Office rejects claims 1-7 and 11-18 presumably under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 4,915,927 of Lipsztajn et al. (Lipsztajn) in view of Faita and Brown. Lipsztajn is cited introducing a membrane electrolyzer including a first cell frame including an anode, a second cell frame including a cathode and a membrane positioned between the anode and the cathode. Each of the frames include two ports. According to the Patent Office, it would be obvious to use a screen spacer of Faita in the cell of Lipsztajn and the transparent or translucent frame from Brown. Claims 1-7 and 11-18 describe a screen spacer interposed as an interface between an electrode and a membrane (claims 1-7 and 11-12) and a spacer interposed as an interface between a cathode and a first membrane (claims 14-18). As noted above, Faita does not describe a spacer interposed as an interface. Accordingly, combining Faita with Lipsztajn would not achieve the teachings of the claims. Brown also lacks a teaching to cure the defect of the citation noted.

Applicant respectfully requests the Patent Office withdraw the rejection to claims 1-7 and 11-18 under 35 U.S.C. §103(a).

H. 35 U.S.C. §103(a): Rejection of Claims 8-10 & 19-20

The Patent Office rejects claims 8-10 and 19-20 under 35 U.S.C. §103(a) as obvious over Lipsztajn in view of Faita, Hirai and Brown.

Claims 8-10 depend from claim 1 and therefore contain all the limitations of that claim. As noted above, claim 1 is distinguishable from Faita in that Faita does not describe a screen spacer interposed as an interface between an electrode and a membrane. Combining Faita with Lipsztajn and the other references will not teach a screen spacer interposed as an interface between an electrode and a membrane.

Claims 19-20 describe a system including a membrane electrolysis unit comprising a plurality of screen spacers including a first screen spacer interposed as an interface between a

Appl. No. 10/645,132
Amdt Dated January 29, 2009
Reply to Office Action of 07/29/2008

first cell frame and a membrane and a second screen spacer interposed as an interface between a second cell frame and a membrane. As noted above, Faita does not teach such screen spacer. Accordingly, combining Faita with Lipsztajn and the other references does not render the claimed system obvious.

Applicant respectfully requests that the Patent Office withdraw the rejection to claims 8-10 and 19-20 under 35 U.S.C. §103(a).

I. Provisional Rejections

The Patent Office has made a number of provisional rejections. Applicant respectfully submits that the provisional rejections are improper because these rejections are not directed to Applicant's prior patent. Reconsideration of the rejection is respectfully requested.

Appl. No. 10/645,132
Amdt Dated January 29, 2009
Reply to Office Action of 07/29/2008

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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